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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/739,975	12/20/2000	Rieko Fukushima	02887.0199	3736

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EXAMINER

RUDE, TIMOTHY L

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 06/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/739,975

Applicant(s)

FUKUSHIMA ET AL.

Examiner

Timothy L Rude

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-11,14,15 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,2,5-7,14,15 and 18 is/are allowed.
- 6) ☒ Claim(s) 8-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claims

1. Claims 3, 4, 16, and 17 are canceled. Claims 1 and 14 are amended.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 8-11 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The batonnet angle of about $\pm 1^\circ$, critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Applicant's claimed invention hinges upon the performance advantages of establishing a batonnet angle within the narrow range of about $\pm 1^\circ$. The broad structural limitations of claims 8-11 are not considered sufficient in light of Applicant's enabling disclosure to result in the critical batonnet angle falling within the narrow range of about $\pm 1^\circ$.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saishu et al (Saishu) USPAT 5,936,689 in view of Nakamura, USPAT 5,686,019.

As to claim 8, Saishu discloses in Figure 1 (col. 6, line 60 through col. 8, line 45), a liquid crystal display element comprising: a first substrate, 114; a switching element disposed on said first substrate; a second substrate, 102, counter to said first substrate; a first alignment layer formed over said switching element, 118; a second alignment layer, 107, formed over said second substrate, wherein said first and second alignment layers are rubbed in rubbing directions (col. 7, lines 35-40); a light modulating layer, 115, disposed between said first and second substrates wherein the light modulating layer comprises an anti-ferroelectric liquid crystal material having a thresholdless voltage-transmittance characteristic (col. 7, lines 43-45); and a filter, 104, formed on said second substrate, wherein said filter allows specific wavelengths of light to pass.

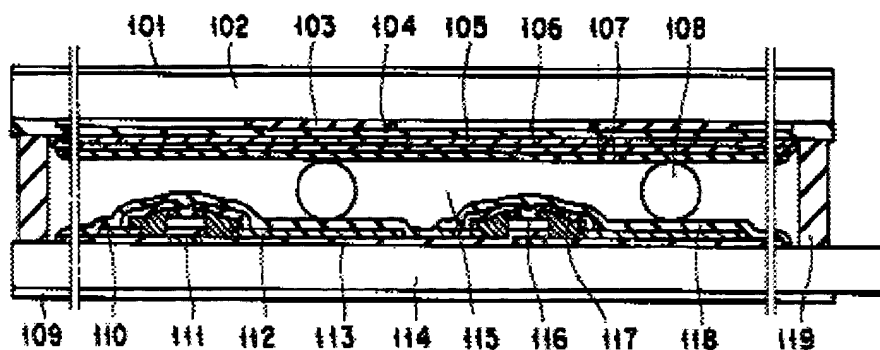


FIG. 1

Saishu does not explicitly disclose an element wherein the surface tension of each of said first and second alignment layers is between about 49 dyn/cm and about 53 dyn/cm.

Nakamura teaches in Example 1 (col. 16, lines 65-69) the use of a surface tension of 50 dyn/cm to establish uniform alignment and improve contrast (col. 17, lines 25-31). Nakamura also teaches in Example 9 (col. 20, lines 64-67) the use of a surface tension of 49 dyn/cm to establish uniform alignment and improve contrast.

Note that in considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom (MPEP 2144.01).

Nakamura is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add alignment layers having surface tension in the range of 49 dyn/cm to 50 dyn/cm (overlaps Applicant's range of 49 dyn/cm to 53 dyn/cm) to establish uniform alignment and improve contrast.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Saishu in with

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the alignment layer surface tension range of Nakamura to establish uniform alignment and improve contrast.

As to claim 9, Saishu discloses the liquid crystal display element of claim 8 wherein the anti-ferroelectric liquid crystal material (col. 7, lines 43-56) is subject to an alignment process (Applicant's phase comprising Iso, SA and SC).

4. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saishu and Nakamura, as applied to claim 8 above, in view of Tanaka.

As to claim 10, Saishu and Nakamura discloses the liquid crystal display element of claim 8.

Saishu and Nakamura does not explicitly disclose an element, wherein said first and second alignment layers are rubbed in a direction which is substantially parallel to a direction 1 shifted from the normal direction of said light modulating layer and wherein the rubbing direction of said first alignment layer is different from the rubbing direction of said second alignment layer.

Tanaka teaches an element, wherein said first and second alignment layers are rubbed in a direction which is substantially parallel to a direction 1 shifted from the normal direction of said light modulating layer and wherein the rubbing direction of said

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first alignment layer is different from the rubbing direction of said second alignment layer (col. 3, para 0013, Purpose and Constitution) to improve contrast.

Tanaka is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add rubbing directions in different directions to improve contrast.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Saishu and Nakamura with the rubbing directions of Tanaka to improve contrast.

As to claim 11, Saishu and Nakamura discloses the liquid crystal display element of claim 8.

Saishu and Nakamura does not explicitly disclose a difference in rubbing directions of about 10 degrees.

Tanaka is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add rubbing directions different by about 10 degrees to improve contrast.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Saishu and Nakamura with the rubbing direction angles of Tanaka to improve contrast.

Allowable Subject Matter

5. Claims 1, 2, 5-7, 14, 15, and 18 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

As to claims 1 and 14, relevant prior art of record did not disclose, alone or in combination, a liquid crystal display element as claimed, comprising: an anti-ferroelectric liquid crystal material with a shifted angle between the extending direction and an optical axis of a batonnet within about $\pm 1^\circ$ and wherein the first and second rubbed alignment layers have a surface tension of 49 dyn/cm to 53 dyn/cm. The closest combination is Tanaka in view of Nakamura. Tanaka teaches an anti-ferroelectric liquid crystal material sandwiched between said first and second electrode substrates covered with first and second alignment layers and which has a thresholdless voltage-transmittance characteristic, wherein said first and second alignment layers are combined with said liquid crystal material so that the angle between the rubbing directions is 6.8 degrees (col. 3, para 0013) (narrow range includes Applicant's shifted angle between the extending direction and an optical axis of a batonnet is within ± 1 degree). Applicant's Figure 3 shows the shifted angle between the extending direction and an optical axis of a batonnet, $(\theta_{OA}-\theta_B)$, is within ± 1 degree for all examples where the angle of the optical axis, θ_{OA} , is less than 7 degrees (half the 14 degree angle between the rubbing directions). Tanaka's angle between the rubbing directions is only 6.8 degrees which is much less than 14 degrees, so the resulting shifted angle between

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the extending direction and an optical axis of a batonnet might be within ± 1 degree, per Applicant's Figure 3.

Tanaka does not explicitly disclose an element, wherein said first and second alignment layers have a surface tension of 49 dyn/cm to 53 dyn/cm.

Nakamura teaches in Example 1 (col. 16, lines 65-69) the use of a surface tension of 50 dyn/cm to establish uniform alignment and improve contrast (col. 17, lines 25-31). Nakamura also teaches in Example 9 (col. 20, lines 64-67) the use of a surface tension of 49 dyn/cm to establish uniform alignment and improve contrast.

However, it is considered not obvious to apply the teachings of Nakamura to the display of Tanaka because the motivation with respect to the batonnet angle is lacking, so one cannot reasonably predict the claimed critical feature would be obtained by the combination of Nakamura to Tanaka.

As to claims 2, 5-7, 15, and 18, they are directly or indirectly dependent upon claims with allowable subject matter above.

Response to Arguments

6. Applicant's arguments with respect to claims 8-11 have been considered but are moot in view of the new ground(s) of rejection.

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Conclusion

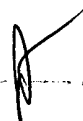
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (703) 305-0418. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

Timothy L Rude
Examiner
Art Unit 2871

TLR
June 2, 2003


Timothy L Rude
Examiner
Art Unit 2871